

ART. XVIII.—*Observations upon Bulam, Vomito-Negro, or Yellow Fever; with a Review of a "Report upon the Diseases of the African Coast, by Sir William Burnet and Dr Bryson," proving its highly contagious powers.* By SIR WILLIAM PYM, K. C. H., Inspector-General of Army Hospitals, and Superintendent-General of Quarantine. London, 1848: 12mo. pp. 311.

*An Account of the Origin, Spread, and Decline of the Epidemic Fevers of Sierra Leone; with Observations on Sir William Pym's Review of the "Report on the Climate and Diseases of the African Station."* By ALEXANDER BRYSON, M. D., R. N. London, 1849: 12mo. pp. 174.

*Copy of a Letter of the Superintendent-General of Quarantine (Sir William Pym) to the Lords of the Privy Council, in reply to Dr. King's Report upon the Boâ Vista Fever, said to have been introduced into the Island by the Eclair Steamers.* Ordered by the House of Commons to be printed. August, 1848: folio, pp. 16.

THE leading object of the publication of Sir William Pym is to prove that the "Bulam, or vomito-negro fever"—the yellow fever of most writers—"is a different disease from the bilious remitting fever; that it is not produced by, nor in any way connected with, marsh miasmata; that it has not been a constant resident either on the coast of Africa or in the West Indies; that it is highly contagious, and capable of being imported to, and propagated in, any country enjoying a certain degree of heat; that, like small-pox, it attacks the human frame but once, and attacks, in a comparatively mild form, natives of a warm climate, or Europeans whose constitutions have been assimilated to a warm climate by a residence of a certain number of years; and, lastly, that it differs from other diseases, in having its contagious powers increased by heat, and totally destroyed by cold, or even by a free circulation of cool air."

Mr. Pym's book contains a very large amount of materials, collected from different sources, bearing more or less directly upon the several points above enumerated—but so badly arranged, and carelessly collated, as to render it a very laborious task to follow him in his chain of proofs; while it would require a volume, almost equal in size to his own, to analyze the evidence he has adduced, and place it in that light in which its real value will become apparent.

The difference between yellow fever and bilious remittent fever; the non-miasmatic origin of the first; the necessity, for its production, of a certain amount of temperature; its cessation upon the occurrence of cold or frost; and the comparative immunity from its attacks of the natives of those localities to which it is endemic, as well as of those who have been acclimated to them, being facts already fully established by the investigations of the physicians of our own country, and very generally admitted by those of our writers and teachers who are, upon this subject, admitted to be among the best authorities, it is hardly worth while to go over the evidence which Mr. Pym has adduced, to prove these to be the distinctive features of yellow fever.

The point, however, which he advances in relation to the highly contagious character of yellow fever, and its capability of being imported to, and propagated in, certain countries, being a disputed one—and, in opposition to which, the minds of perhaps a majority of the most authoritative American physicians are fully made up, and upon what they believe to be the best and most conclusive evidence—an examination of the facts upon which Mr. Pym bases his decision, will be interesting. He has pointed, in his preface, to the portions of the work which he considers as most positively establishing the fact of the infectious nature of the fever of which he treats, and its importation into certain ships and communities.

Before considering this evidence, we would remark that Mr. Pym admits that a continued fever of a very bad type, in which jaundice or yellowness of the skin is a very frequent symptom, has prevailed in the West India Islands ever since their discovery, and which has been denominated the seasoning fever and yellow fever by writers on the diseases of those islands.

Mr. Pym thus describes the bilious remittent and the bilious continued, or sporadic, fevers of the West Indies, neither of which he admits is contagious.

"The first is an endemic of all warm climates; it is the jungle fever of the East Indies, the bilious remittent of the West Indies, and the malaria or remittent of the Mediterranean, prevailing more particularly in the neighbourhood of marshy and uncultivated ground.

"The second, the bilious continued, is the common fever produced by exposure to the sun, excess in drinking, and other irregularities. But, in addition to these two fevers, a third, the one under consideration, the Bulam or vomito-negro (of the Spaniards), a highly contagious disease, has, at different periods, made its appearance in the West Indies, in North America, and in the south of Spain, and supposed to have been originally imported from the coast of West Africa.

"The *first variety* of the disease, the bilious remittent, assumes such a diversity of forms and symptoms, owing to the constitution of the patient, the heat of the climate, and the degree of concentration of the marsh miasmata, that it is difficult at its commencement to draw a diagnosis between it and the two others; as the disease advances, however, it shows its characteristic mark by remissions, and succeeding exacerbations; and, if it proves fatal without evident remissions, which in its more violent form it sometimes does, *on the third or fourth day*, it is very rarely (if ever) attended with the fatal symptom peculiar to the Bulam fever, viz. the black vomiting."

"In the *second variety*, or bilious continued fever, the headache is confined chiefly to the temples, the pulse is remarkably full, but not so quick as in the two others; the yellowness appears very early in the eyes, and on the second or third day the *whole body is tinged of a very deep yellow*; it is not attended with the same degree of irritability of stomach as in the first and third varieties; it *has no remission or exacerbation*, but runs its course as a continued fever, in from five to eight, or ten days, and, when terminating fatally, is not attended with black vomiting.

"In the *third variety*, the Bulam or vomito-negro fever, there is at the first attack a peculiar shining or drunken appearance in the eyes; the headache is excruciating, and confined to the orbits and forehead. *It has no remission*, and in mild cases, when it terminates favourably, is rarely attended with yellowness of the skin, which, if it does take place, is of a *pale lemon* colour; it runs its course in from one to five days; it is attended with a peculiar inflammation of the stomach, which, in most cases that prove fatal, terminates in gangrene, or in a diseased state of the villous coat of that organ, accompanied with vomiting of matter resembling coffee-grounds, and a very peculiar bloated appearance of the countenance. In mild cases, however, of this last disease, and of which there are many, it is impossible to point out any symptoms distinguishing it from attacks of fever from any cause; and even in bad cases, until the fatal symptoms make their appearance. I may say (excepting its prevailing epidemically) it is as difficult to decide upon its real nature, as it is in the fever of small-pox before the appearance of the eruption."

It is not necessary to spend any time in discussing the accuracy of this latter assertion. The symptoms of yellow fever are so peculiar, that almost from the first period of its invasion, its diagnosis can certainly not be a matter of much difficulty with those who are familiar with its features.

We have long entertained the opinion that, under the denomination yellow fever, diseases by no means identical in character have been included—the one, probably, a very aggravated form of the bilious continued fever of unhealthy localities, and the other the specific disease denominated Bulam fever by many writers; the one not capable of being propagated by contagion—while the other may be propagated in this manner. There is a possibility, however, that diseases which are not capable of being communicated from the sick to the well, by a strictly contagious miasm, may be communicated by a conveyance of a portion of the poisonous atmosphere by which they are engendered in the holds of ships, or even by the persons of those coming immediately from the infected districts, under particular circumstances, and even when such individuals are not themselves actually labouring under the disease.

The only positive test of the contagiousness of a disease is the escape of all who are strictly isolated from the sick, while those who are in intercourse

with the latter are generally attacked. The notion of a disease being highly contagious, as insisted upon by Mr. Pym in the case of yellow fever, which, at the same time, cannot be introduced and propagated, excepting in countries having a certain amount of atmospheric temperature, appears to us to be an absurdity. Diseases in regard to the contagiousness of which there is no dispute—small-pox, for example—are contagious under all circumstances, however much the virulence of their poison may be augmented by confined, crowded, and filthy apartments, and badly ventilated and otherwise unwholesome localities.

The first evidence Mr. Pym offers to prove the contagious character of yellow fever is that, while, during the years 1800 and 1803, the disease prevailed to a great extent in Spain, to the East and West of Gibraltar—a rigid quarantine being established against the disease—the garrison at the latter place continued healthy; whilst, in 1804, when this precautionary arrangement was discontinued, the disease prevailed there, and occasioned a considerable mortality. To render evidence like this conclusive, it must be shown that all places in which a rigid quarantine is established are by that means preserved from the occurrence of the disease. A host of facts may be adduced to prove the contrary.

The second evidence adduced by our author in proof of the contagiousness of yellow fever is the success of the measures he had recourse to in 1810, when the fever was introduced into Gibraltar from Carthage.

During the prevalence of yellow fever at the latter place in 1810, four transports from that port, all having cases of the disease on board, anchored in the Bay of Gibraltar, on the 19th of September. The soldiers, who had as yet escaped the disease, amounting to seventy-seven, were removed from the transports on board of two hulks. These individuals were supplied with new blankets and clothing, and before entering the hulks were stripped and bathed; their old clothes and bedding being destroyed. During the course of the first ten days, six men were removed to the hospital ship from one hulk, and eight from the other, after which the disease disappeared.

"During the time that the disease had been going on on board the transports in the bay, the garrison continued in perfect health until the 20th of October, when, in consequence (*as I must suppose*) of a breach of quarantine regulations, *which, however, could not be detected*, a Minorcan family in the south district, belonging to the dock yard, was attacked with the disease."

A number of cases occurring in the neighbourhood, the whole of the infected persons in the infected district, with their baggage, were removed, under a strong guard, to tents pitched outside the gates of the garrison, and the houses and remaining furniture thoroughly purified.

"Within a few days after the removal of the sick, several persons (all neighbours of the first family taken ill) were declared to be infected, and removed, under the necessary precautions, to the neutral ground."

On the morning of the 28th of October, two men died of the disease, in the Seventh Veteran Battalion, and several others were sick in the hospital. Five fresh cases were also reported in the barracks in the course of the day. The whole regiment, with the hospital establishment, were removed outside the garrison.

"Very few men were reported sick after the regiment moved into quarantine. Three of them, however, were taken ill in the same tent. Six died from the disease, who were all taken ill in the same barrack room."

"Two cases of black vomit also appeared in the hospital of the Fourth Veteran Battalion; one officer of that regiment, quartered in the south district, died with the same symptoms; and a lady who resided in town, but who had kindly assisted the last-mentioned officer during his illness, fell a victim to it on the third day of her indisposition. Mrs. Nicholls, also, whose maid-servant was one of the first taken ill in the infected district, was carried off in forty-eight hours after being attacked by it." "The only member of the Minorcan family who escaped the disease (a boy), continued in health during the time of his quarantine, but was attacked the fifth day after his return to his habitation, and died with black vomiting in less than seventy hours' illness. Upon inquiry, it was ascertained that the inspector of the district had neglected to wash and

purify the bed which this young man slept upon, and which had been used by some of his family when the disease first made its appearance.

"The proofs of contagion here are so indisputable, that it might be thought unnecessary to make any observations upon them; I shall, therefore, only recapitulate, in as few words as possible, that Mr. Arthur, who went on board the transports, and all the sailors who remained on board, caught the disease, while sixty-three out of sixty-seven soldiers who were removed from the focus of contagion, escaped it. The disease on shore commenced in the Minorcan family, and ran through all the members of it, seven in number. The sick soldiers *who died* were all taken ill in the same barrack room. Mrs. Nicholls caught the disease from her servant; and within the walls of the town (a mile at least from the infected district), only two persons were attacked with the disease, viz., the lady who had assisted Captain Boyd, and a priest who attended the Minorcan family."

Now certainly the foregoing facts present no shadow of evidence that the yellow fever was introduced into Gibraltar from the sick on board the transports; and, even presented as they are in the strongest point of view, divested of many collateral circumstances essential to the settling of the question at issue, they cannot be received as conclusive evidence that, in any one of the cases alluded to, the disease was communicated by a poisonous emanation from the bodies of the sick. We see, in the whole course of the disease as above detailed by Mr. Pym, the evidence of its occurrence from morbid causes existing in a certain district of the town, and infecting those, and those only, who were exposed to the influence of these causes. But two cases, we are assured, occurred in individuals living out of the infected district, and both of these had been within that district. This localization of the yellow fever in particular neighbourhoods of a city is familiar to American physicians, who are accustomed to put a stop to the disease by removing the inhabitants, sick and well, from the infected district, and permitting no one to enter it until after the occurrence of frost—a plan which would be calculated rather to spread than to arrest an actually contagious disease.

We shall only present one or two more of the facts that are especially referred to by Mr. Pym as evidence of the contagiousness of yellow fever.

The Bann sloop-of-war arrived at the Island of Ascension, with the yellow fever on board, on the 25th of April, 1823. At this time, the garrison on shore were healthy, but the Bann had already buried thirty-two men. All intercourse between the former and the sick tents of the latter was forbidden.

"In a short time, however, fever made its appearance among the garrison on shore, in the family of a soldier's wife, who had been washing for one of the Bann. *It first seized a boy*, then the woman herself, and, in a few days, four men belonging to the garrison were attacked. Of the crew of the Bann, consisting of about 130, not so many as ten escaped fever, and thirty-eight died; and of the Island of Ascension the garrison, consisting of 36 souls, five only escaped fever, and seventeen died."

In 1838, the disease again appeared at the Island of Ascension. The Brigantine Forester arrived at Ascension from Sierra Leone, with the yellow fever on board. On her arrival, the sick were disembarked at a cove, from one to three miles from the barracks, where the garrison is quartered. A rigid quarantine was established on the sick from on board the Forester.

"The wearing apparel of the deceased commander, Lieutenant Rosenberg, was, *I have been told*, taken on shore, and there sold by public auction in the garrison. The disease broke out in the garrison *about four weeks after the Forester's arrival*." "The disease, on this as on the former occasion, did not appear among the garrison at Ascension until after the arrival of a sickly ship, and the actual debarkation on the island of persons labouring under the disease."

The following is another evidence offered by Mr. Pym in proof of the contagiousness of the yellow fever:—

"The Eden, on her arrival at Sierra Leone, found two midshipmen on board one of her prizes, who had both been attacked by the fever. One died in the prize, the other was removed to the Eden on the 5th of May, and died on the

6th. The next that sickened was John Russel, a seaman, who had volunteered from the shore; he was attacked on the 3d of May, and died on the 17th. After this time, there was not any addition to the list of fever cases until the 12th." Between this latter date and the 1st of June, forty-one cases occurred. The whole number of deaths was twenty-five.

It is by such extremely bald and loose statements that Mr. Pym attempts to establish the contagious character of yellow fever. Had we the time, we could, from other authentic sources, show that the evidence adduced is worth nothing in the settlement of this question. That there is just as much evidence, and of a more positive and circumstantial character, to prove that, in every one of the instances adduced to prove the introduction into a community of the yellow fever from the crews of diseased vessels, and its subsequent spread by contagion, the disease originated and was propagated by endemic causes alone. A mere perusal of so much of the evidence as we have presented must convince every unprejudiced mind of its vague and unsatisfactory character.

Mr. Pym makes much use of the introduction of disease into Boâ Vista by the steamer *Eclair*, in 1845, in support of his favourite theory. This, we admit, is among the strongest portions of evidence he has presented. Judging from the documents in our possession, we are forced to acknowledge that the proofs of the importation into that island of a very fatal malady, by the steamer just referred to, and its subsequent communication from the sick to the well, are conclusive. But we have no direct evidence that the disease thus introduced and propagated into Boâ Vista was actually the yellow fever. We confess we have strong doubts as to its being so; and, until this fact is established, the Boâ Vista fever cannot be admitted as positive evidence that yellow fever can be introduced into a community, and subsequently spread among its members by contagion.

The work of Dr. Bryson is a severe and searching review of that of Mr. Pym. The author places in bold relief most of the weak points in the statements and reasonings adduced by the latter in support of his views in relation to the true character of yellow, Bulam, or black vomit fever. He has also attempted to show a want of ingenuousness on the part of Mr. Pym in the quotation of facts, so as to bend them to the support of his opinions, and, on more than one occasion, accuses him of keeping out of view evidence invalidating that which he adduces.

As a specimen of Dr. Bryson's manner of handling the work of Mr. Pym, we present the following—and cannot but admit, severe as it is, that it is deserved.

"As Sir William Pym appears to wish it to be understood that his views respecting yellow fever are peculiar, it may be as well to state, in as few words as possible—although that will be no easy task—what they are. In the first place, at page 8, he says there are three varieties of fever in warm climates, viz.: 1st variety, the bilious remittent, in different degrees of concentration, prevailing in marshy and uncultivated districts. 2d variety, the bilious continued, or sporadic, arising from exposure to the sun, excessive drinking, and other irregularities. 3d variety, the Bulam, or vomito-negro, which, although a variety of tropical fever, 'is a disease *sui generis*' (p. 6), 'and differs from all others' (p. 67), 'and so far appears to be the offspring of heat, that its powers both of contagion and destruction are increased by it to a wonderful degree (p. 59).' 'The closer the situation, and the more stagnant the air, the greater has been its virulence;' 'it shows a wonderful predilection for particular constitutions' (p. 63). That, although it is capable of naturalizing itself in any permanently warm climate (p. 63), 'it is peculiar to Africa; its source being in the interior' (p. 259), yet it attacks natives of that country in a comparatively mild form. That it is not indigenous in the West Indies, but, being contagious, it leads an erratic existence, 'and has, at different times, been carried from the coast of Africa to the West India Islands, and then imported to Europe and America' (p. 48). Yet he contradicts this at page 8, where he states, 'it broke out spontaneously in three companies, quartered in some casemates in Fort Edward.' 'That the poison remains dormant only a few days' (p. 65),

'and does not affect beyond a few yards' (66). That it is non-remittent, is accompanied with bright yellowness of the skin, and black vomit, and that it never attacks the same person more than once.

"In mild cases, of which there are many, it is not distinguishable from other fevers from any cause, and, even in bad cases, *not until the fatal symptoms* occur (p. 4). Yet 'it is possessed of peculiarities distinguishing it from all other diseases' (p. 5). That 'its greatest peculiarity is its attacking the human frame but once—and as has been proved (asserted?) to as great a certainty as it has been in the small-pox or measles, that peculiarity ought to put the question at rest as to its being a disease *sui generis*' (p. 6). 'It is a disease of a rather whimsical character, but regular in its irregularities' (60), and 'it is in no way connected with malaria, marshes, or *unhealthy situations*' (p. 95).

"He goes on to state that this fever, although *it cannot be distinguished* in the mild cases *from fevers arising* from any cause, and, in bad cases, not until the fatal symptoms occur, yet may be divided into four forms. To those who have not seen yellow fever, these infinitesimal divisions may seem rather perplexing; but here follows a sample of the key to the mystery. The first symptoms of the first form of the Bulam fever are: languor and chills; of the second, languor and chills, increased to shivering; of the third, aggravation of the latter; of the fourth, nothing but languor, chilliness, and rigor, with pains in the loins and calves of the legs. In the first form, the eyes have a peculiar shining or drunken appearance; in the second, they are glassy and slightly inflamed; in the third, there is aggravation of all these symptoms; the eyes, therefore, are more shining, drunken-like, glassy, and inflamed; and, in the fourth, the symptoms are not so violent as in the third; the shininess, &c., is consequently in a degree somewhere between the second and third.

"To compare the state of the tongue, the pulse, the skin, and various other symptoms, would occupy more space and time than I can afford, and certainly more than the subject deserves. He does not explain how the standard of the first form is to be taken, or what degree of aggravation of the symptoms will constitute the second form; or how he manages when several symptoms increase, and the others are stationary, or retrograde. Anything more preposterous than the arbitrary division of tropical fever into so many varieties, forms, and divisions, can hardly be conceived. Yellow fever, like the fevers which infest our lanes and alleys, occurs in different degrees of severity; but there are no means of classifying these, as it will seldom happen that there are two cases precisely alike. I have been thus particular in pointing out Sir William Pym's peculiar opinions, with regard to the distinctive character of tropical fevers, because I think it will go far to prove one of two things, namely, that he has either seen but little of yellow fever, and of that little he has been a superficial observer; or, if he has seen much of it, he has, by confused and vague distinctions, depending on accidental circumstances, and by contradictory statements, endeavoured to obfuscate, and to shroud in mystery, the little we do know concerning it."

"I believe it is generally considered that yellow fever, like other fevers, *occurs spontaneously* in Africa, in America, and in the West Indian Islands; that it *most frequently breaks out*, and is most fatal (as far as regards Europeans) *in unhealthy localities*; that, although it has most frequently prevailed in marshy places, near the coast, probably from their being most frequented by Europeans, yet it has also been observed in dry and hilly situations; that at one time it may attack only a few individuals sporadically; while at another it may prevail epidemically; that there has not been discovered anything peculiar to it, beyond a general aggravation of the symptoms, sufficient to distinguish it from the more severe fevers of the West Indies, and the west coast of Africa, usually denominated bilious or remittent; that *it is sometimes contagious, remittent, or non-remittent*, according to the violence or duration of the attack, many cases terminating with one paroxysm; that it is accompanied by yellowness of the skin, differing in shade according to complexion, temperament, the severity of the attack, or other accidental circumstances, and frequently with black vomit in the fatal cases; that it may affect the system more than once, but generally only at distant periods. Sir William Pym endeavours, not by the pro-

duction of reasonable proof, but by reiteration and assertion, to maintain that his view of the question is the right one, and that every other, however modified, is wrong; whereas, those who differ from him do so on the authority of well-founded facts, which prove incontestably that he attempts to make a distinction where there has not yet been discovered any difference; there not being any symptom, or series of symptoms, by which, if there be, as he affirms, three distinct fevers peculiar to these regions, each divisible into several subordinate forms or grades, the one may be distinguished from the other. With respect to remissions, they can hardly be regarded as a fair test of yellow fever, unless any, the slightest, abatement of pyrexial action be acknowledged to be a remission; or, if that be denied, until the degree of abatement necessary to constitute a remission be specifically defined, and generally admitted. I think, however, I shall have little trouble in proving that remissions are by no means infrequent in yellow fever. As to the non-liability to a second attack, this, I presume, for the present, must remain a disputed point, or, until some few persons who have had black vomit recover, and have, at a subsequent period, a second attack, in which black vomit again occurs. But, even then, although there is not, perhaps, one in a thousand recoveries from this symptom, the superintendent-general of quarantine may take upon himself to assert that one of the attacks must have been the bilious remittent fever; in which he says black vomit may also sometimes occur, and the fever may terminate without a remission."

We have extended the foregoing quotation from the work of Dr. Bryson to a greater length than what we had first intended, as it presents not only a tolerably fair critique upon the contradictions and inconsistencies into which Mr. Pym has fallen, in attempting to define his peculiar views in regard to the character and causation of yellow fever; but, also, as expressing an exposition of the opinions of the former gentleman upon those important questions. We cannot agree with him as to the yellow fever being merely an aggravated form of the bilious remittent of hot climates, dependent upon the same causes, and distinguishable from it only by the greater violence of its symptoms. If any particular in reference to yellow fever has been satisfactorily proved, it is, we think, its specific character, and its distinctness from the autumnal remittents of the same climates to which it is endemic. This distinctness is shown in the difference of the symptoms and progress in the two diseases; the difference in the particular localities in which they occur; and the very strikingly decreased liability of those who have once suffered from yellow fever to a subsequent attack of that disease; and the undiminished susceptibility of those who have had one attack of bilious remittent to a second attack of the disease. And we find that even Dr. Bryson is not so well convinced, as his language in the quotation given above would lead us to suppose. After adducing his proofs of the assumed identity, which are anything but conclusive, he remarks:—

"The question as to the individuality of yellow fever has already been partly disposed of. This, by the way, is an assumption which *I am not prepared to deny*; but I am not cognizant of any proof that has been brought forward at all calculated to support it; whereas, there is at least *strong presumptive evidence* that the fever is but an aggravated or an *altered* form of the endemic. For instance, it can hardly have escaped notice that, previous to each successive irruption of yellow fever in Sierra Leone, the common endemic gradually assumed a more concentrated form, until it merged, or *seemed to merge*, into the former; while, after a time, the diminution in the force of the symptoms, the number of attacks, and the proportional mortality, was again equally remarkable; as this form declined or reverted to the common endemic, so intimately were the two forms mixed up together, that, as has been already observed, it was not possible to tell where the one began, and the other ceased. As farther evidence in the same line of argument, Staff-Surgeon Ferguson (although he latterly adopted the view with respect to the specific character of the disease), has remarked: 'Cases of endemic remittent, which have commenced in districts not yet visited by the malignant remittent, have become malignant on being removed to an infected district.' It has, at the same time, been frequently observed, that cases of yellow fever, on being removed away from the

site of their origin, have assumed a milder form than those left in the infected spot."

That upon the yellow fever breaking out in any locality, it should overshadow, or blot out, as it were, the ordinary endemic diseases, is not at all surprising—and it is equally reasonable to suppose that, upon the disappearance of the former, the latter diseases will again make their appearance. But to prove that the two diseases are identical, it must be shown that, in numerous instances, the one runs into the other; that, in persons labouring under the ordinary symptoms of bilious remittent fever, these, in a shorter or longer period, become changed into those of yellow fever, and *vice versâ*. The change in the remittent fever from mild to malignant, or a diminution occurring in the intensity of the symptoms of the yellow fever, by the removal of the patient labouring under the first to an unhealthy locality, and of those labouring under the latter into a more pure and healthy atmosphere, is no proof certainly that these two diseases are the same, merely differing in violence.

Dr. Bryson, as we have seen, admits that yellow fever is sometimes contagious, and sometimes not—though we cannot understand how this radical change in the character of a disease is effected, if the Doctor means by contagion the emanation from the person affected with yellow fever of a specific poison, capable, as in the case of small-pox, of producing in another, by whom that poison is received, a disease similar to that by which the poison was produced. In this sense, we deny that a disease can be contagious at one time, and non-contagious at another. If Dr. Bryson means to say that, in any instance, the yellow fever is capable of being communicated to those who are in contact or attendance upon the sick to the well, in a pure, healthy atmosphere, we deny that, in any instance, this has occurred. But we suspect that Dr. Bryson uses the term *contagious*, in reference to yellow fever, in a sense in which, though we object to the term, we can fully agree with him. Facts innumerable can be adduced to prove the propagation of yellow fever under the circumstances alluded to in the following quotation:—

"Believing, as we must do, the testimony of the medical officers of the colony, and reasoning from the facts which they have brought forward, and those also which have been handed down by other authorities, it is impossible to arrive at the conclusion that yellow fever ever became generally contagious in Sierra Leone; that it has been partially so, if we are to be guided by the same data, is indeed almost equally improbable, unless we can suppose that the evolution of the reproducing virus was but a rare and an accidental occurrence, that it was extremely diffusible and lasting, and uncertain in its action, and that its influence on the human organism depended on some contingent cause, which existed only in the low, damp level immediately contiguous to the river. That it became contagious in the Bann, Eden, Forester; perhaps in the *Ætna* or the *Bonetta*, or in both; and in the *Eclair*, has become clearly established. In each of these vessels, there existed that condition under which diseases, not in their simple form generally contagious, acquire the property of propagating themselves—such as erysipelas, ophthalmia, and synochal fever. The first, in vessels of war, seems frequently to be governed, with regard to its extension, by precisely the same laws as yellow fever. A ship's company may remain for years perfectly free from this disease; but, if two or three cases occur, the probability is it will then extend to others, but principally to those who are affected with ulcerative disease, and ultimately it may attack almost every man who receives the slightest hurt or scratch. In these instances, the contaminating poison, it would appear, is propagated through the medium of atmospheric agency, and, as in yellow fever, it exerts the baneful influence first on the circulating fluids. And again, the common synochal or typhoid fevers of this country, under peculiar circumstances, such as occur in badly-regulated emigrant ships, rapidly acquire this property, become highly contagious, and fearfully destructive of life. In 1847, the *John Bolton* left Liverpool with 576 passengers, all of whom embarked in good health; before she arrived at Quebec, 72 deaths had occurred, to which are to be added 35 while she remained in quarantine, and 34 more in the quarantine hospital, making a total of 141. The *Bee*, from Cork, out of 352 emigrants, lost on the passage, and in quaran-



tine at Quebec, 165, being, within a fraction, one-half of the number embarked. The *Avon*, from the same place, lost 246 out of 552 embarked. The *Virginius*, out of 476, lost on the passage and in quarantine 267, being 29 more than the half. These cases are strictly analogous to those of the *Bann* and *Eclair*, and clearly enough pointed out the influence which imperfect ventilation, dampness, and mental dejection have in increasing the destructive powers of febrile diseases; for, even admitting that the seeds of the worst form of typhus existed among them when they went on board, still the dreadful aggravation of the malady, by accidental circumstances, remains the same. Had these emigrants been resident for a short time in Sierra Leone or Fernando Po, and embarked under similar circumstances from these places, I have not the slightest doubt that fever would, in the same manner, have made its appearance, and would have been attended with yellowness of the skin and black vomit, although there had not been a case with the latter symptoms at either of those places for months before.

"How, then, are we to account for the latter symptoms? Do they depend on an epidemic influence, or are they the result of a peculiar morbid action dependent on a specific animal contagion, or are they merely the result of febrile action operating on, or in conjunction with, an abnormal state of the vital forces, and a deteriorated state of the blood? These are questions I shall not attempt, for the present, to answer. It may, however, be mentioned, that, as the skin displays the yellow tinge, so in proportion is the severity of the disease; and when this is carried one stage farther—when the blood becomes still farther diseased, defective in its plastic properties, and oozes from the delicate vessels of the mucous tissues—then black vomit occurs; and unquestionably, under these circumstances—particularly in low, damp, densely-populated localities—the disease, as is the case in erysipelas, synochal fever of a purely idiopathic form, puerperal fever, influenza, hospital gangrene, cholera, and probably other diseases, becomes contagious."

Mr. Pym adduces a number of instances as evidence of the introduction of yellow fever, in places previously free from the disease, by the arrival of infected persons or effects. Of some of these cases of the presumed introduction of the disease, Dr. Bryson speaks as follows:—

"To those who rigidly uphold the doctrines of contagion, the second case which occurred in the *Sybilie*, at Fernando Po, should not be without interest. Admitting for the moment that it was the result of a personal cause, the virus must have been brought from the *Eden*, either in contact with the clothes or persons of the marines who came from that ship; or it must have been conveyed simply by the atmosphere, a distance perhaps of a hundred yards; or, if the contagion emanated from the first of the party attacked, who was sent on shore before the symptoms were fully developed, then it must be generated at an earlier stage of the disease than is generally believed. The first case which occurred in the garrison at Ascension, in 1838, is also not undeserving notice. It has been shown that the young person, the subject of this case, could not have had any communication whatever either with the sick of the vessel in the harbor or with their clothes, and, as the wind blows regularly off the land to the anchorage, it is not possible to suppose that infection could have been wafted from the latter to the shore. There were men sent to the hospital, but they came from vessels in which the fever did not exist, and passed to leeward of the house in which she resided.

"Viewing the subject as a contagionist, the re-appearance, perhaps, of the disease in the *Hecla* at Princes', and certainly in the *Sybilie* for the third time, at St. Helena, is not without interest. The time between the death of Mr. Tebbs at Bathurst, and the next succeeding case, was *thirty days*; this, even allowing for the incubative stage, is a long period for the retention of the poison in connection with inanimate substances: again, at Sierra Leone, by straining probability to its utmost, it might be argued that the seeds of the disease remained in a dormant state for three months in a vessel without a crew."

"That any animal matter emanating from a living body in a vaporous, or, at all events, in an invisible form, should resist decay for weeks or months, seems highly, if not altogether, improbable; but, if this be not admitted, then the frequent spontaneous evolution of the disease, by proving the existence of a phy-

sical or an epidemic cause, will greatly militate, even in the minds of those who advocate the doctrine, against the supposition that the fever is so frequently contagious as it would appear to be, were we to admit that the poison germ may be shut up in clothes, houses, or ships, for an indefinite period."

Even at the risk of being accused of extending our quotations from the works before us to an unusual length, we feel constrained to add, to those already given, the general conclusions laid down by Dr. Bryson in regard to the fevers of Africa. They show how feeble are the reasons for rejecting the views in relation to yellow fever, advocated by those physicians in this country who have had the best opportunities for a full investigation of the disease, and who have availed themselves of those opportunities to the greatest extent.

"Without," Dr. Bryson remarks, "attempting to offer any theoretical opinions of my own respecting the disease, the following conclusions, so far as the fevers of Africa are concerned, seem to be clearly deducible.

"First. *It breaks out spontaneously* amongst debilitated Europeans, in certain localities north of the equator, where fevers of the same type prevail; and as these cease when the former appear, and re-appear when the latter ceases, there are no means of accounting for the change but by supposing that the one is a modification of the other.

"Secondly. It prevails principally, and with the greatest malignancy, at low levels on or near the sea coast, and in ships of war, from the number of men crowded together—it *infests particular spots, independently of contagion*; a fact which has been ascertained, but the cause is not known."

"Thirdly. It occurs in various degrees of intensity; the development of the symptoms being sometimes rapid, sometimes slow; some cases terminating with one or more paroxysms of fever, and with little detriment to the system, within an average period of from two to seven days; while others, presenting precisely the same symptoms, and differing only in degree as respects the force of pyrexial action, may terminate within the same period in death.

"Fourthly. If it be a distinct disease, it cannot in its sporadic form be diagnosed from the common remittent fever of the same regions; in its epidemic form, its existence can only be ascertained or suspected by an unusual increase in the number of cases, and the more frequent occurrence of black vomit when it proves fatal.

"Fifthly. It apparently becomes contagious under conditions similar to those which occasionally impart the same character to the fevers of the temperate zones, erysipelas, hospital gangrene, influenza, and probably cholera; and, under these conditions, it is propagated by the same laws. In proportion to the concentration of the poison, all conditions remaining the same, so will be the virulence of the disease.

"Sixthly. On the western coast of Africa, it has on several occasions displayed or acquired great malignancy, and the property of propagation on board certain ships, and has thus been communicated to Europeans far distant from the site of its origin; but, *in the majority of these instances, there existed both in the ships and the localities to which it was taken, concurrent circumstances favourable to the evolution and propagation of febrile disease.*"

The caution exhibited by Dr. Bryson in the wording of the foregoing conclusions, and the candour with which he has stated the facts which militate against his own views, while they do great credit to his honesty, give additional force to the doctrines of those who believe that the yellow fever is a disease of a specific character, produced by other causes than those which give rise to intermittent and remittent fever—running its course to a favourable or fatal termination in a single paroxysm of from 72 to 120 hours' duration, absolutely non-contagious, and only contingently infectious.

The letter of Sir William Pym on the subject of the Boâ Vista fever is a criticism, not in the very best taste, of the letter of Sir Wm. Bennett on the same subject. As our readers have already been presented with an analysis of those documents, upon the facts detailed in which an opinion as to the circumstances under which the fever alluded to originated in the Island of Boâ Vista, can be formed, and as the letter of Mr. Pym contains no new facts calculated to place the matter in a clearer point of view, we shall not enter into an examination of it.

D. F. C.